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S-E-C-R-E-T SECRET

50X1-HUM

The electrical values of resistors are specified by various methods. In Kaminskiy resistors, the figure indicating their resistance value is stamped on a brass plate. The value of variable and a fixed wire-wound resistors is denoted by figures on their housings. A color code is employed to designate the value of TO resistors [this color code is the same as the Radio Manufacturers' Association standard code for fixed composition resistors with radial leads except for the use of a band instead of a dot to specify the decimal multiplier].

Another important characteristic of a resistor is the power which it can dissipate as heat without changing its rated value. Type TO resistors are produced with three main power ratings, 0.25 w (5 x 17 mm), 0.5 w (7 x 33 mm), and 0.75 w (10 x 46 mm). Kaminskiy resistors are rated at 0.5 w.

In addition to TO resistors, type LS fixed-composition resistors are also used extensively. These resistors are produced with four main power ratings, 0.25 w (4.3 x 17 mm), 0.5 w (4.3 x 21 mm), 1 w (6 x 29 mm), and 2 w (6 x 49 mm). Type LS resistors are produced with tolerances of 5, 10, and 20%.

The following variable composition resistors are produced: type VK (without a switch), type TK (with a switch), and the "Omega" type.

Wire-wound vitreous resistors are used when large amounts of power (up to several watts) must be dissipated. Vitreous resistors, with values from 10 to 30,000  $\Omega$ , are now produced by Soviet industry.

All types of fixed composition resistors presently produced by Soviet industry are standardized with regard to tolerances in three classes,  $\pm 20\%$ ,  $\pm 10\%$ , and  $\pm 5\%$ .

#### Capacitors

There are many different types of capacitors, e.g., with paper, mica, and ceramic dielectrics, electrolytic capacitors, etc.

The main technical indexes of a capacitor, i.e., capacitance and working voltage, are stamped on it. The test voltage used at the producing plant is also shown in some cases.

The fixed capacitors produced by Soviet industry have received the following names for the dielectric used in them and from their shape:

TK (tikondovyy), flat with a ceramic dielectric; they are produced with capacitances from 5 to 1,500  $\mu$ fd.

SAM, flat mica; produced with capacitances from 10 to 10,000  $\mu$ fd.

KSO, mica, molded into a plastic; produced with capacitances from 10 to 50,000  $\mu$ fd.

KB, tubular, with paper dielectric; produced with capacitances from 0.005 to 0.2  $\mu$ fd.

BJK, tubular with paper dielectric, special anti-induction construction; produced with capacitances from 0.005 to 0.5  $\mu$ fd.

BP, capacitor with paper dielectric enclosed in a special iron case [bathtub capacitor]; produced with capacitances from 0.1 to 2.0  $\mu$ fd.

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MK, capacitor of the same design, but smaller dimensions than the BP type; produced with capacitances from 0.25 to 2.0  $\mu$ fd.

MKV, same as the MK type, except for increased resistance to moisture; produced with capacitances from 0.25 to 2.0  $\mu$ fd.

KES-1 and KES-2, electrolytic capacitors; produced with capacitances from 5 to 2,000  $\mu$ fd and for various working voltages.

Type KSO capacitors, most frequently used in radio equipment, are divided into 13 groups (from KSO-1 to KSO-13), depending on their design and size.

Capacitors are divided into four classes, according to permissible deviation from rated capacitance. These are: class 0, tolerance of  $\pm 2\%$ ; class I, tolerance of  $\pm 55\%$ ; class II, tolerance of  $\pm 10\%$ ; class IV, tolerance of  $\pm 20\%$ .

Type KSO capacitors are divided into the following four groups with respect to temperature stability of rated capacitance (in  $\%$ ): A, unlimited; B, 0.5; V, 0.2; and G, 0.1.

Capacitors are marked by inscriptions on the body. For example, the inscription KSO-5-500-G-5100-1 means capacitor type KSO, fifth group, 500 v working voltage, group G (according to temperature stability of capacitance), 5,100  $\mu$ fd capacitance, and accuracy class I (tolerance of  $\pm 5\%$ ).

Special highly stable capacitors with ceramic dielectric are produced for use in radio equipment such as tuning, isolating and grid capacitors.

Fixed capacitors with ceramic dielectric are produced in tubular and disk forms, and are called correspondingly KTK (capacitor, tubular, ceramic) and KDK (capacitor, disk, ceramic). With regard to design and size, KTK capacitors are divided into five groups (KTK-1 to KTK-5). The KDK capacitors are divided into groups KDK-1 to KDK-3. Each of these groups is produced for definite capacitance values and has definite temperature coefficients in four classes, Zh, M, R, and S.

#### Importance of Resistors and Capacitors in the Radio Industry

An indication of the importance of resistors and capacitors in the present-day radio industry is furnished by the following list of the parts in a typical modern Class II line receiver. On the average, such a receiver has:

<u>Radio-Receiving Part</u>	<u>Value</u>	<u>No</u>
Type TO fixed resistors of various powers	80-120 K $\Omega$	2
	20-50 K $\Omega$	4
	1-2 M $\Omega$	7
	2-5 K $\Omega$	2
	.2-1 K $\Omega$	4
	2-5 M $\Omega$	4
	over 3 M $\Omega$	1
Wire-wound resistors	1 $\Omega$ -300 $\Omega$	4
	0.01-0.05 $\mu$ fd	7
Fixed mica capacitors	0.1-0.5 $\mu$ fd	3
	100-500 $\mu$ fd	8
	1,000-3,000 $\mu$ fd	3
	5-50 $\mu$ fd	5

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<u>Radio-Receiving Part</u>	<u>Value</u>	<u>No</u>
Trimmer capacitors	5-50 <i>Mfd</i>	7
Variable capacitors (two-gang)	17-415 <i>Mfd</i>	1
Electrolytic capacitors (450 v working voltage)	10-20 <i>Mfd</i>	3
Electrolytic capacitors (20-50 v working voltage)	10-50 <i>Mfd</i>	2
Speaker		1
Band switch		1
Potentiometers (with resistance from 0.5 to 1 M $\Omega$ )		2
Tuning knobs (plastic)		4
Tube sockets		6
Bulbs for scale illumination (6.3 v, 0.25 a)		2
Power transformers		1
Filter chokes		1
Intermediate-frequency transformers		2
Circuit coils		2
Terminals and telephone jacks		6

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